

Comment on Illinois Electric Vehicles Notice of Inquiry

The Illinois Commerce Commission (ICC) has issued a [Notice of Inquiry](#) regarding the conscious intensification of electric vehicle (EV) concentration in the fleet. Several of the submissions thus far have cited a [September 2017 study](#) conducted by MJ Bradley & Associates,¹ which reports large net benefits to the state under two different scenarios of EV penetration. The ICC's Notice of Inquiry does not pertain to a specific proposed rule, and thus our comments should not be construed as an endorsement or critique of any particular policy for the state. Nonetheless, the estimates of the alleged "net benefits" of EV penetration in the MJ Bradley study are at various times misleading and flawed, and Illinois officials should be aware of the potential problems when considering EV policy options.

Potential Consumer Cost Savings

Roughly 90 percent of the reported net benefits from EV penetration is due to a reduction in operating costs for Illinois drivers—in other words, that it will be cheaper for them to recharge their EVs rather than buy gasoline for conventional vehicles.

Such calculations are quite speculative and rely on many assumptions, including (for example) the initial purchase price of the respective vehicles, the pattern of charging (such as time of day) for EVs, as well as prices for gasoline and electricity over the lifetime of a vehicle.

The following sub-section documents a number of the study's dubious assumptions and claims:

¹ "Electric Vehicle Cost-Benefit Analysis: Plug-in Electric Vehicle Cost-Benefit Analysis: Illinois," MJ Bradley & Associates, September 2017, available at: [https://mjbradley.com/sites/default/files/IL PEV CB Analysis FINAL 26sep17.pdf](https://mjbradley.com/sites/default/files/IL%20PEV%20CB%20Analysis%20FINAL%2026sep17.pdf)

- Most of the savings claims result from assumptions that more than 90 percent of all future EV charging occurs at off-peak residential rates in a perfect distribution across the hours from midnight to 4:00am (while comparing it to a baseline where all charging is on peak).
 - This not only hides all impacts to peak demand and assumes the EVs pay virtually nothing for demand charges (to pay for generation capacity) and not only hides all impacts and needs for massive upgrades to transmission and distribution, but it adds significant costs to the baseline to create nonexistent future benefits.
 - The off-peak benefits are based on charging technology, metering, and infrastructure that currently do not exist and have not been demonstrated in real-world application.
 - The savings from lower gasoline purchases are found by assuming only off-peak EV charging at very low electricity rates.
 - The study ignores the very large cost of commercial EV charging stations and higher impacts on-peak and costs of drawing much more power than residential chargers.
 - The study illogically claims that off-peak charging will produce more revenue than the cost of providing the service and lower customer bills.
- The study assumes a much higher percentage of the future gasoline-fueled fleet is light trucks (more than double what is on the road today), inflating vehicle and fuel costs relative to EVs and hiding the EV cost premium by assuming trucks are more expensive; meanwhile, it assumes a reduction of 70 percent or more in EV battery costs by 2030.
- The study assumes an unrealistic number of EVs on the road, inflating benefit estimates—6 to 10.8 percent of light duty vehicles on the road in 2030.
- It is unclear if the study assumes utilities will offer \$10,000 subsidies per EV and/or that Illinois will offer \$4,000 subsidies per EV.

- The study underestimates the electricity needed to charge EVs: no charging conversion losses or transmission losses, which collectively require 16 percent more electricity than the study's assumptions, are taken into account.
- The study assumes gasoline prices increase 70 percent while electricity increases 10 percent.
- The study does not appear to include any EV sub-metering costs.
- The study adds upstream gasoline emissions, but no upstream emissions from EV and battery manufacturing or emissions associated with fuel production or delivery to power plants.

The problems with the MJ Bradley study are manifold, but, fortunately, policymakers need not concern themselves with such calculations. At any given time, consumers are capable of deciding for themselves whether it makes more sense to buy an electric or a gasoline-powered vehicle. If indeed the typical Illinois driver will “save money” by buying an EV, then no one on the ICC needs to tailor government policies to make that happen.

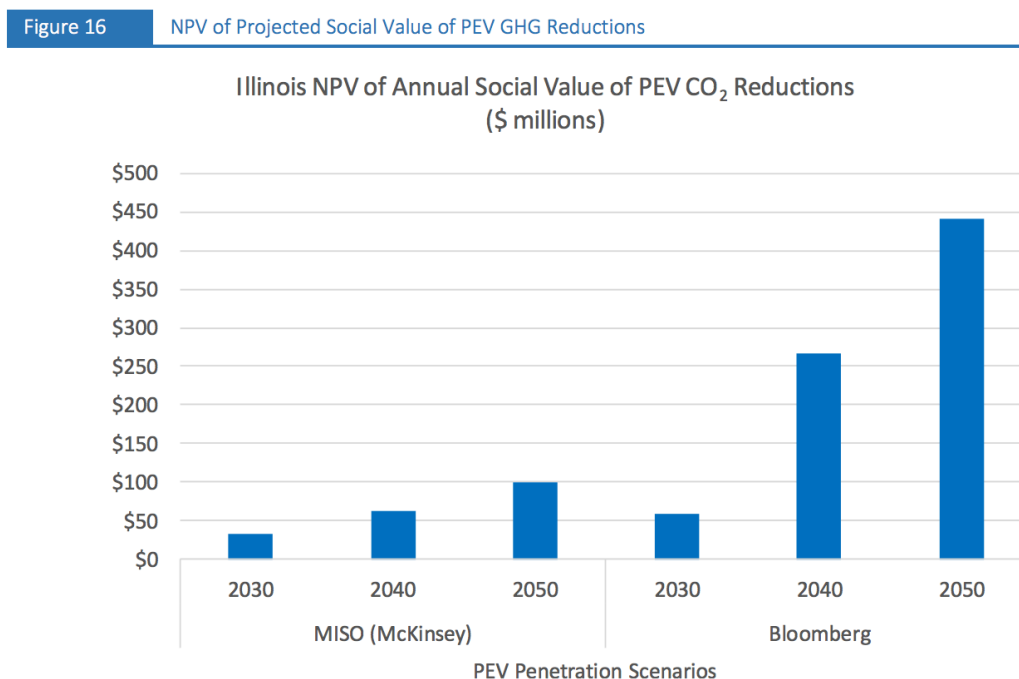
It's true that government regulation affects electrical utilities and thus the availability and rates for electricity to EV owners—which in turn influences the decision on whether to buy an EV or a gasoline-powered vehicle—but even here, Illinois policymakers do not need to concern themselves with calculations of “net savings to drivers.” They only need to cater to cost and market demand conditions, in order to let utilities pursue profitability in the service of their customers.

The best way for Illinois policymakers to promote the “optimal” speed of EV penetration is to promote competition and stable rules, so that the Illinois electricity market approximates a standard market as much as possible.

Alleged Social Benefits of GHG Reductions

Just about all of the remaining 10 percent of estimated total benefits derives from alleged “social benefits” accruing to society at large from reduced greenhouse gas (GHG) emissions. (A negligible portion of the MJ Bradley study’s total estimated benefits comes from benefits to utility customers.) Specifically, the study looks at two different EV penetration scenarios and estimates the incremental drop in Illinois GHG emissions, over and above the reduction that would have occurred *without* extra EV penetration, simply from turnover of the fleet into more advanced vehicles.

The following figure summarizes the study’s estimates of social benefits from EV penetration:



SOURCE: [MJ Bradley & Associates](#) (2017)

As Figure 16 (reproduced from the study) indicates, the MJ Bradley analysis estimates a substantial annual “social value” from EV penetration, especially as we

move further into the future. (The difference between the MISO and Bloomberg scenarios is due to the assumed usage of EVs in either.)

These figures are calculated by taking the estimated incremental reduction in CO₂ emissions (for a given scenario) and then multiplying by the “social cost of carbon” (SCC) as estimated by the Obama Administration. There are several problems with this procedure.

In the first place, we at IER have published quite extensively on the flaws with the social cost of carbon (SCC) concept. Our most comprehensive critique is the [formal Comment we submitted](#) to the Office of Management and Budget in early 2014.² Among various problems, the SCC is dubious as a guide to policymakers because it is extremely malleable. Simply by adjusting the discount rate used in the analysis, the calculated SCC can range from several hundred dollars per ton down to \$0 or even negative—all while holding the underlying simulations of climate change identical. Rather than being analogous to a physical constant such as the charge on an electron, the “social cost of carbon” reflects the modeling decisions of the analyst.

In light of this and other objections, the Trump Administration has considered substantially reduced estimates of the SCC. If these reduced estimates of the SCC had been used, the MJ Bradley study’s findings regarding the “social value” of emission reductions would in turn be substantially reduced. To reiterate, several of the problems we document with the SCC as a concept to guide policymakers have *nothing* to do with disputes over the physical science of climate change or its impact, but reflect arbitrary judgments concerning the discount rate or whether to limit the analysis to the United States as opposed to assessing effects worldwide.

² IER’s formal comment on the Obama Administration’s use of the “social cost of carbon” is available at: <https://www.instituteforenergyresearch.org/wp-content/uploads/2014/02/IER-Comment-on-SCC.pdf>

However, and even more relevant for Illinois policymakers, *the estimate of a global “social cost of carbon” is virtually useless for policy changes at the state level.* This is because of the phenomenon of “leakage.” Specifically, if Illinois policymakers adopt measures that promote faster EV penetration among Illinois drivers, the reduction in emissions from the state of Illinois will be partially counterbalanced by *increased emissions in other states, such as neighboring Indiana and Missouri.*

If Illinois drivers accelerate their adoption of EVs, then the demand for gasoline will fall. This will slightly lower the national (and even world) price of gasoline, making it cheaper for other motorists who continue to use gasoline-powered vehicles. Therefore, if Illinois policymakers artificially promote the use of EVs in their state, they will at the same time be encouraging drivers elsewhere to *delay* the adoption of EVs, because gasoline will be cheaper than it otherwise would have been.

To the extent that global climate change is a problem, it is a *global* problem. Policy measures that affect the use of gasoline at the level of a U.S. state will be very muted, because they influence such a small proportion of the total source of emissions. For this reason alone, the estimated “social value” of enhanced EVs in the MJ Bradley study is vastly overstated.